APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/055,352	01/22/2002	Srinivas Gutta	US020030	9283

24737	7590	10/08/2004

PHILIPS INTELLECTUAL PROPERTY & STANDARDS
P.O. BOX 3001
BRIARCLIFF MANOR, NY   10510

EXAMINER
HIRL, JOSEPH P

ART UNIT	PAPER NUMBER
2121	

DATE MAILED: 10/08/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/055,352	GUTTA ET AL.
	Examiner	Art Unit
	Joseph P. Hirl	2121

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>13 July 2004</u>.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-14</u> is/are pending in the application.

     4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-14</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>22 January 2002</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

     a)☐ All   b)☐ Some *   c)☐ None of:

         1.☐ Certified copies of the priority documents have been received.

         2.☐ Certified copies of the priority documents have been received in Application No. _____.

         3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

     * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
     Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
     Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

1.   This Office Action is in response to an AMENDMENT entered July 13, 2004

for the patent application 10/055,352 filed on January 22, 2002.

2.   The First Office Action of April 16, 2004 is fully incorporated into this Final Office

Action by reference.

Status of Claims

3.   Claims 1-14 are amended. Claims 1-14 are pending.

Claim Rejections - 35 USC § 101

4.   35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

5.   Claims 1-14 are rejected under 35 U.S.C. 101 because the claimed invention is

directed to non-statutory subject matter. Claims 3 and 4 relate to claim 2 and similarly

claims 10 and 11 relate to claim 9 wherein in all instances, the function is either random

or pseudorandom. From the specification at page 7, lines 21-22, the inventor

acknowledges that a sporadic alteration of the learning rate does not always increase

the rate of convergence. Consequently, for the lack of concreteness, the disclosure is

non statutory.

Claim Rejections - 35 USC § 102

6.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7.   Claims 1-14 are rejected under 35 U.S.C. 102(b) as being anticipated by

Mehrotra (MIT Press, 1997, Artificial Neural Networks, referred to as **Mehrotra**).

Claim 1.

Mehrotra anticipates initializing a set of weights of the self-ordering map

(**Mehrotra**, p 189, Fig. 5.16); and, iteratively training the weights over many training

epochs (**Mehrotra**, p 189, Fig. 5.16); wherein, for at least a number of the training

epochs, iteratively training the weights includes updating the weights based on a

learning rate that is generated according to a function that changes in a fashion that is

other than monotonical a decreasing value with training epoch (**Mehrotra**, p 192, l 1-3;

Examiner's Note (EN): to one of ordinary skill in the art, monotonical decreasing means

never remaining constant or increasing; Mehrotra remains constant for certain periods

of time; see monotonic discussion below).

Claims 2., 9.

Mehrotra anticipates the function includes a random or pseudorandom function

(**Mehrotra**, p 192, l 1-3; EN: to one of ordinary skill in the art, random means random

with a uniform distribution such as a normal distribution; Mehrotra matches a normal

distribution wherein the abscissa is the independent variable "t" and the ordinate is $\eta(t)$;

the peak of the distribution is set at .5 and remains constant to t = 6; unless the variance is tight, the top of the distribution will be close to flat; Mehrotra then steps down to a value of .25 at t =6 until t = 12 again following the distribution; similarly, Mehrotra then steps down to .1 for t > 12; the step values follow the distribution and are therefor representative of a pseudorandom $\eta(t)$).

Claims 3.

Mehrotra anticipates the random or pseudorandom function has a range that decreases with the training epoch (**Mehrotra**, p 192, l 1-3).

Claims 4.

Mehrotra anticipates the random or pseudorandom function is configured such that the learning rate tend to decrease with the training epoch (**Mehrotra**, p 192, l 1-3).

Claims 5., 6., 7., 10., 11., 12., 13., 14.

Mehrotra anticipates the function has a range that decreases with the training epochs (**Mehrotra**, p 192, l 1-3)

Claim 8

Mehrotra anticipates choosing a random value for initial weight vectors (**Mehrotra**, p 188, l 28); drawing a sample from a set of training sample vectors and applying it to input nodes of the self ordering feature map (**Mehrotra**, p 189, Fig. 5.16); identifying a winning competition node of the self ordering feature map according to a least distance criterion (**Mehrotra**, p 189, Fig. 5.16); adjusting a synaptic weight of at least the winning node (**Mehrotra**, p 189, Fig. 5.16), using; a learning rate to update the synaptic weight that is based on a function other than one that is monotonic with

subsequent training epochs (**Mehrotra**, p 192, l 1-3); iteratively repeating the drawing,

identifying, and adjusting to form each subsequent epoch (**Mehrotra**, p 189, Fig. 5.16).

Response to Arguments

8.   The rejections of claims under 35 USC 112", first and second paragraph, are

withdrawn.

9.   `   The rejection under 35 USC 101 of claims 2-4 (concreteness) and 8-14 (utility

and concreteness) remain.

In reference to Applicant's argument:

The Office action further asserts that a random or pseudorandom function cannot be limited as claimed in claims 3, 4, 10, and 11. The applicants respectfully disagree with this assertion. A random or pseudorandom function can easily be configured to return random numbers within a given range of values, and the given range of values can be adjusted at any time. Claims 3 and 10 recite that the function that is used to select a learning rate for each training epoch has a range that decreases with the training epochs; this limitation can easily be applied to a random or pseudorandom function by merely adjusting the given range of values to the random or pseudorandom function in a decreasing fashion. In like manner, claims 4 and 11 recite that the function provides an output value that tends to decrease with the training epochs. Again, this limitation can easily be applied to a random or pseudorandom function by merely adjusting the upper bound on the given range of values to the random or pseudorandom function in a decreasing manner.

Examiner's response:

        Such ranges or intentions are not identified in the related claims. Further, and as

stated in the First Office Action, dated April 16, 2004, p 3, lines 15-17, applicant

acknowledges that there is a lack of concreteness in the application of a random or

pseudorandom approach. The utility concern for claims 8 and hence 8-14 is focused on

the limitation in claim 8 that the synaptic weight is based on "a function other than one

that is monotonic with subsequent training epochs". Here the applicant has excluded

both increasing and decreasing monotonic functions. Since the applicant has not identified the "whatever" function, the Examiner asserts that there are no other functions that meet the limiting criteria. A random or pseudo random function has both monotonic increasing and decreasing features related to the training epochs.

10.   Applicant's arguments filed on July 13, 2004 related to 35 USC 102(b), Claims 1-14, have been fully considered but are not persuasive.

In reference to Applicant's argument:

In each of the applicants' independent claims 1-14., the applicants specifically recite that the function that provides the learning rate for the training epochs is other than a monotonically decreasing function. Mehrotra teaches the conventional use of a monotonically decreasing function, and thus does not teach the applicants' invention.

In reference to Applicant's argument:

This is simply not the case. Claim 1 does limit to other than a monotonically decreasing value with the training epochs. However, claim 2 has a random function which functions either way: increasing or decreasing. Claims 3-7 all decrease with the training epochs. Claim 8 may not have utility since the "whatever" function has not been identified by applicant and such function is unknown. Claim 9 introduces the random or pseudo random function that has both increasing and decreasing monotonic features. Claims 10-14 are all related to trends that decrease (monotonically).

In reference to Applicant's argument:

The Office action asserts that "monotonical decreasing means never remaining constant or increasing" (Office action, section 12, lines 10-11). The applicants respectfully note that this is an incorrect definition of a monotonical decreasing function, a monotonical decreasing function does not increase, there is no limitation in a monotonical decreasing function that it never remain the same. A conventional "staircase" function is a typical monotonic function (either increasing or decreasing, depending upon whether the stairs are leading up or down). Webster's New Collegiate Dictionary provides the following definition:

"monotonic: having the property of never increasing or, never decreasing as the independent variable increases".

Because Mehrotra teaches a monotonically decreasing function for providing the learning rate for training a neural network, and the applicants specifically claim a function other than a monotonically decreasing function, the applicants respectfully request the Examiner's reconsideration of the rejection of claims 1-1.4 under 35 U.S.C. 102(b) over Mehrotra.

In reference to Applicant's argument:

Since monotonic function is a mathematical term, an appropriate definition for

such term would be found in a mathematical reference such as "mathworld.

wolfram.com" wherein the following definition is found:

Monotonic Function

A function which is either entirely nonincreasing or nondecreasing. A function is monotonic if its first derivative (which need not be continuous) does not change sign.

If a function is decreasing and then levels out, the initial derivative will be

negative and when the function levels out the derivative will be zero or neutral. Hence

there is a sign change from negative to neutral and hence such an operation is not

monotonic decreasing and the reference (Mehrotra, p 192, l 1-3) applies.

Examination Considerations

11.   The claims and only the claims form the metes and bounds of the invention.

"Office personnel are to give the claims their broadest reasonable interpretation in light

of the supporting disclosure. *In re Morris,* 127 F.3d 1048, 1054-55, 44USPQ2d 1023,

1027-28 (Fed. Cir. 1997). Limitations appearing in the specification but not recited in

the claim are not read into the claim. *In re Prater*, 415 F.2d, 1393, 1404-05, 162 USPQ

541, 550-551 (CCPA 1969)" (MPEP p 2100-8, c 2, l 45-48; p 2100-9, c 1, l 1-4). The

Examiner has full latitude to interpret each claim in the broadest reasonable sense.

Examiner will reference prior art using terminology familiar to one of ordinary skill in the

art. Such an approach is broad in concept and can be either explicit or implicit in

meaning.

12.   Examiner's Notes are provided to assist the applicant to better understand the

nature of the prior art, application of such prior art and, as appropriate, to further

indicate other prior art that maybe applied in other office actions. Such comments are

entirely consistent with the intent and spirit of compact prosecution. However, and

unless otherwise stated, the Examiner's Notes are not prior art but a link to prior art that

one of ordinary skill in the art would find inherently appropriate.

13.   Examiner's Opinion: Paras 11. and 12. apply. The Examiner has full latitude to

interpret each claim in the broadest reasonable sense.

Conclusion

14.   Applicant's amendment necessitated the new ground(s) of rejection presented in

this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37

CFR 1.136(a).

15.   A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the date of this final action.

16.   Claims 1-14 are rejected.

Correspondence Information

17.   Any inquiry concerning this information or related to the subject disclosure

should be directed to the Examiner, Joseph P. Hirl, whose telephone number is

(703) 305-1668. The Examiner can be reached on Monday – Thursday from

6:00 a.m. to 4:30 p.m.

If attempts to reach the Examiner by telephone are unsuccessful, the

Examiner's supervisor, Anthony Knight can be reached at (703) 308-3179.

Any response to this office action should be mailed to:

Commissioner of Patents and Trademarks,

Washington, D. C. 20231;

or faxed to:

(703) 746-7239 (for formal communications intended for entry);

or faxed to:

(703) 746-7290 (for informal or draft communications with notation of

"Proposed" or "Draft" for the desk of the Examiner).

Note: During the last two weeks of October 2004, Art Unit 2121 will move to

Carlyle, Randolph Building, 5th floor and my phone and fax number will change to: 571-

272-3685 and 571-273-3685, respectively. Similarly, Anthony Knight's phone and fax

numbers will change to: 571-272-3687 and 571-273-3687.

Joseph P. Hirl

October 5, 2004

Anthony Knight
Supervisory Patent Examiner
Group 3600